

(12) **UK Patent Application** (19) **GB** (11) **2 248 841** (13) **A**  
(43) Date of A publication 22.04.1992

(21) Application No 9022593.9

(22) Date of filing 17.10.1990

(71) Applicant  
**AEI Cables Limited**

**(Incorporated in the United Kingdom)**

**Crete Hall Road, Northfleet, Gravesend, Kent,  
DA11 9DA, United Kingdom**

(72) Inventors  
**Robert John Wale Powell  
Roy Leonard Clements**

(74) Agent and/or Address for Service  
**GEC Patent Department, (Wembley Office),  
The General Electric Company Plc,  
Hirst Research Centre, Wembley, Middlesex, HA9 7PP,  
United Kingdom**

(51) INT CL<sup>5</sup>  
**C08K 9/04**

(52) UK CL (Edition K)  
**C3K KXX K124 K125  
C3L LDP  
C3W W207  
U1S S1362 S1384 S3011 S3071**

(56) Documents cited  
**GB 2217336 A GB 1287576 A GB 1143787 A  
GB 0820207 A GB 0730555 A GB 0533639 A  
EP 0214922 A2 EP 0112118 A2 US 3740244 A  
US 3632395 A US 3538041 A2**

(58) Field of search  
**UK CL (Edition K) C3K KDA KEB KMA KXX, C3L  
LDP LJA  
Online databases:WPI**

(54) **Coloured polymeric material**

(57) Polymeric materials such as ethylene vinyl acetate are coloured by incorporating a coloured or dyed filler material such as alumina trihydrate into said polymeric material. A method of colouring or dyeing alumina trihydrate is also disclosed.

**GB 2 248 841 A**

-1-

**A Polymeric Material Including a  
Dyed Filler Material**

The invention relates to a polymeric material including a dyed filler material and a method of making said dyed filler material.

In certain applications of polymeric material including a filler material it is desirable to incorporate a colouring agent into the filled polymeric material. Such filled polymeric materials have a tendency to develop white marks or lines on the surface thereof when they are abraded or scuffed. This is believed to be caused by exposure of particles of white filler material in the polymeric material. One example of such known coloured polymeric material is ethylene-vinyl acetate filled with a fire retardant-material alumina trihydrate (ATH) being used for applications such as cable sheathing and accessories.

It is an object of the present invention to provide a polymeric material into which a dyed filler material is incorporated so that when articles made from such filled polymeric material are damaged or abraded, white lines or marks do not appear on the surface of a damaged or abraded articles.

A further object of the present invention is to provide a method for producing a dyed filler material for use in polymeric materials.

According to the invention there is provided a coloured polymeric material including a dyed filler material incorporated into the polymeric material as a colouring agent or one of the colouring agents for the polymeric material.

Further according to the invention there is provided a coloured ethylene vinyl acetate polymeric material including dyed alumina trihydrate incorporated into said polymeric material as a colouring agent or one of the colouring agents for the polymeric material.

According to another aspect of the present invention there is provided a method of making a dyed filler material for use in polymeric materials, the method comprising precipitating a mordant on to said filler material and fixing a mordant dye on to said filler material.

Preferably the filler material is a fire retardant material such as alumina trihydrate.

The filler material may be a water insoluble material such as magnesium silicate or calcium carbonate.

The mordant may be a compound of aluminium, chromium or zirconium.

The mordant dye may be alizarin dye such as Alizarin Red S (dihydroxyanthraquinone sulphate sodium) or triarylmethane dye such as Aluminon (tri-ammonium aurine tricarboxylate).

A fire retardant material such as alumina trihydrate can be dyed by using the method of the present invention which involves adding to the fire retardant material an aluminium sulphate solution. The pH of the solution is then raised by the addition of ammonia to a value where aluminium hydroxide is precipitated. The supernatant liquid is then removed and a solution of Alizarin Red S is added and the pH again adjusted to maximise the colouration of the fire retardant material. The supernatant liquid is removed and the fire

retardant material is dried. The drying temperature is chosen to ensure that there is no volatile substance in the material which will be released during processing. The dyed fire retardant is then incorporated into the polymeric material.

CLAIMS

1. A coloured polymeric material including a dyed filler material incorporated into the polymeric material as a colouring agent or one of the colouring agents for the polymeric material.
2. A polymeric material as claimed in Claim 1, in which said filler material is a fire retardant material.
3. A polymeric material as claimed in Claim 2, in which said filler material is alumina trihydrate.
4. A coloured ethylene vinyl acetate polymeric material including dyed alumina trihydrate incorporated into said polymeric material as a colouring agent or one of the colouring agents for the polymeric material.
5. A method of making a coloured or dyed filler material for use in polymeric materials, the method comprising precipitating a mordant onto said filler material and fixing a dye onto said filler material.
6. A method as claimed in Claim 5, in which said filler material is alumina trihydrate.
7. A method as claimed in Claim 5 or 6, in which said mordant is a compound of aluminium, chromium or zirconium.
8. A method as claimed in Claim 7, which comprises the steps of adding a solution of aluminium sulphate to the filler material, adding ammonia to said solution of aluminium sulphate and filler material so as to precipitate aluminium hydroxide onto said filler material, removing the supernatant from said solution, adding to said solution a dye solution so as to fix the dye onto said filler material, removing the supernatant from said solution of the dyed filler material and thereafter heating to dry said dyed filler material.
9. A coloured polymeric material according to Claim 1 substantially as hereinbefore described.
10. A method of making a coloured or dyed filler material substantially as hereinbefore described.

**(tents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number

9022593.9

**Relevant Technical fields**

(i) UK CI (Edition J ) C3K (KDA, KEB, KMA, KXX)  
 C3L (LDP, LJA)

(ii) Int CI (Edition )

**Search Examiner**

C T BILBY

**Databases (see over)**

(i) UK Patent Office

(ii) Online databases: WPI

**Date of Search**

8 November 1990

Documents considered relevant following a search in respect of claims  
 1-10

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB A 2217336 (Hyman) (Examples 2 and 3)	1
X	GB A 1287576 (Ciba-Geigy) (Examples)	1
X	GB A 1143787 (Reynolds Metal)(page 9 lines 102-110	1,2,3,5,6,7,8
X	GB A 0820207 (Burke)(Examples, page 38 lines 74-78	1
X	GB A 0730555 (Waddington)(page 1 lines 60-66 and Examples)	1,3,5,6
X	GB A 0533639 (Dupont)(Examples)	1
X	EP A2 0214922 (BASF)(Examples)	1
X	EP A2 0112118 (Montedison)(Examples)	1,2,3,5,6,7,8
X	US A 3740244 (Yano)(Examples)	1
X	US A 3632395 (Dyson)(Examples)	1,2,3,5,6,7,8
X	US A 3538041 (Dyson) (Examples)	1,2,3,5,6,7,8

Category	Identity of document and relevant passages	Relevant to claim(

### Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).